Chapter Five
AIRPORT PLANS

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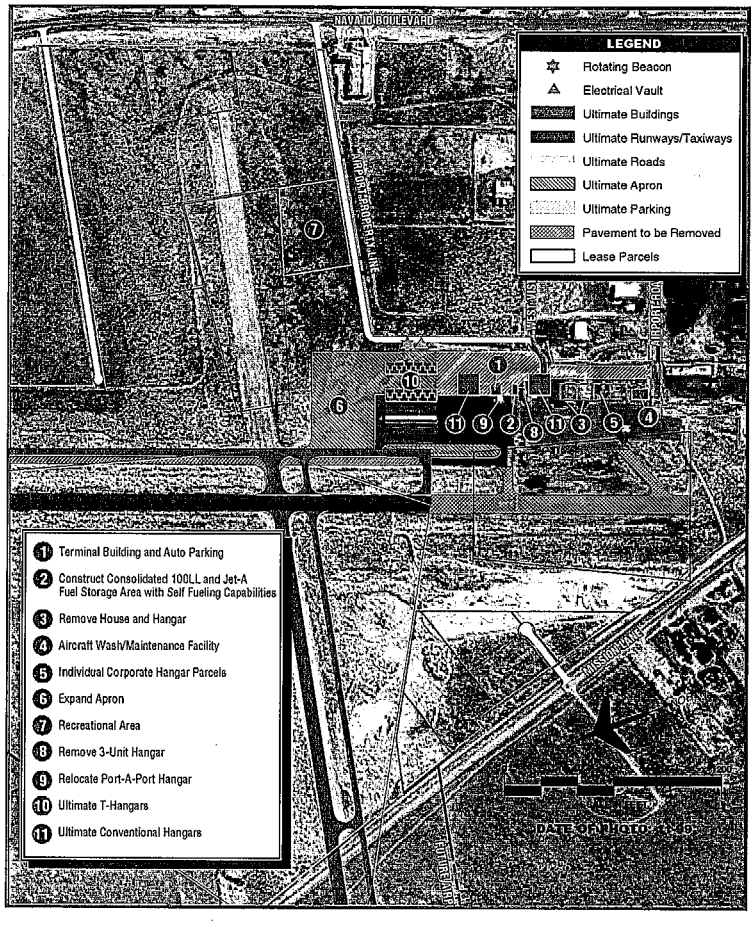
MUNICIPAL AIRPORT

The airport master planning process has evolved through several analytic efforts in the previous chapters intended to analyze future aviation demand, establish airside and landside facility needs, and evaluate options for the future development of the airside and landside facilities. The planning process, thus far, has included the presentation of two phase reports, representing the first four chapters of the Master Plan - to the Planning Advisory Committee (PAC), which has provided feedback to the consultant. The recommended master plan concept did not evolve until members of the PAC and City of Holbrook officials had the opportunity to provide feedback on the draft phase reports. Having completed the review meetings and reviewing suggestions from PAC members, the development alternatives have now been refined into a single recommended master plan concept. The purpose of this chapter is to describe in narrative and graphic form, the recommended direction for the future use and development of Holbrook Municipal Airport.



RECOMMENDED MASTER PLAN CONCEPT

The recommended master plan concept provides for anticipated facility needs over the next twenty years as well as the airport's ability to accommodate aviation demand for the Holbrook Municipal Airport well beyond this period. Additionally, the recommended master plan concept includes provisions to ensure the long term viability and self-sufficiency of the airport by maximizing developable properties at the airport for aviation and non-aviation related development. **Exhibit 5A** provides a depiction of the recommended airfield improvements. **Exhibit 5B** depicts the recommended

landside facility layout. The following sections summarize airside and landside recommendations.

The FAA has established design criteria to define the physical dimensions of runways, taxiways, and imaginary surfaces which protect the safe operation of aircraft at the airport. FAA design standards also define the separation criteria for the placement of landside facilities. As discussed previously in Chapter Three, FAA design criteria is a function of the critical design aircraft's - the most demanding aircraft or "family" of aircraft which will conduct 500 or more operations (take-offs and landings) per year at the airport - wingspan and approach speed, and in some cases, the runway approach visibility minimums. The Federal Aviation Administration (FAA) has established the Airport Reference Code (ARC) to relate these factors to airfield design standards.

As discussed in Chapter Three, the current critical design aircraft at Holbrook Municipal Airport fall within ARC B-I (aircraft approach speeds less than 120 knots, wingspans less than 49 feet) design standards. As discussed in Chapter Two, the potential exists in the future for increased use of the airport by business turboprop and turbojet aircraft. This follows with the national trend of increased business and corporate use of turboprop and turbojet aircraft, strong sales and deliveries of turboprop and turbojet aircraft, and expanded fractional ownership programs for these aircraft.

As noted in Chapter Three, common business turboprop (i.e. Beechcraft Super King Air) and turbojet (i.e. Dassault Falcon, Cessna Citation) aircraft have larger wingspans than aircraft currently operating at the airport; however, most of these aircraft have similar approach speeds to the existing mix of aircraft operating at the airport. These larger wingspans are expected to change the critical aircraft designation for the airport. Ultimately, the airport is expected to accommodate aircraft within ARC B-II (aircraft approach speeds less than 120 knots, wingspans less than 79 feet).

As the primary runway, Runway 3-21 is planned to accommodate the critical design aircraft and will need to conform to ARC B-II design standards. Based upon the wind analysis summarized in Chapter Three, Runway 11-29 is needed to safely serve small aircraft (aircraft less than 12,500 pounds) during crosswind conditions. FAA design standards specify that this runway should conform to ARC B-I design standards. **Table 5A** summarizes the planning standards (based upon the ultimate critical design aircraft at Holbrook Municipal Airport) which were used in the ultimate design and layout of the airport.

Runway 3-21 presently meets runway length and width standards, however, Runway 3-21 does not fully meet object free area (OFA), runway protection zone (RPZ), and runway/taxiway separation distance standards. As detailed in Chapter Four, sufficient area is not provided off the Runway 3 end to provide for ARC B-II OFA standards. Furthermore, the Runway 3 RPZ extends beyond the existing airport property line. Federal Aviation

Administration standards preclude development within the OFA and RPZ. These areas are also recommended to be under the control of the airport.

TABLE 5A
Airfield Design Standards by ARC (in feet)

	Runway 3-21	Runway 11-29
Airport Reference Code **Approach Visibility Minimums**	B-II One Mile	B-I[1] Visual
Runway		
Width	75	60
Runway Safety Area (RSA)		
Width	150	120
Length Beyond Runway End	300	240
Object Free Area (OFA)		
Width	500	250
Length Beyond Runway End	300	240
Obstacle Free Zone (OFZ)		
Width	400	250
Length Beyond Runway End	200	200
Runway Centerline To:		
Parallel Taxiway Centerline	240	150
Edge of Aircraft Parking Apron	250	125
Runway Protection Zone (RPZ)		
Inner Width	500	250
Outer Width	700	450
Length	1,000	1,000
Obstacle Clearance	34:1	20:1
Building Restriction Line[2]		
Distance from Runway Centerline	390	265
Taxiways		
Width	35	25
Safety Area Width	79	49
Object Free Area Width	131	89
Taxiway Centerline To:		
Parallel Taxiway/Taxilane	105	69
Fixed or Moveable Object	65.5	44.5
Taxilanes		
Taxilane Centerline To:		
Parallel Taxilane Centerline	97	64
Fixed or Moveable Object	57.5	39.5
Taxilane Object Free Area	115	79

Source: FAA *Advisory Circular 150/5300-13, Airport Design*, F.A.R. Part 77, TERPS
[1]Small aircraft less than 12,500 pounds
[2]20-foot building height

Two options to comply with OFA and RPZ standards were presented in Chapter Four. The first option examined the possibility of implementing declared distances to comply with OFA criteria and obtaining an avigation easement (or acquiring the property) encompassing the portions of the RPZ extending outside the airport property line. The second option involved shifting Runway 3-21 1,302 feet northeast (by relocating the Runway 21 threshold 1,302 feet northeast) to locate the OFA and RPZ entirely on existing airport property.

Considering the PAC and City of Holbrook desire to reduce the impacts of aircraft overflights on existing and planned developments along Mission Lane, the recommended master plan concept includes the option of shifting Runway 3-21 to the northeast to conform with OFA and RPZ standards. This provides the added benefit of ensuring the ultimate approach surface for Runway 3 would extend above existing land uses southwest of Mission Lane and reduce height restrictions placed on development in this area.

As shown on **Exhibit 5A**, shifting Runway 3-21 1,302 feet northeast requires the acquisition of approximately 17 acres of land to protect the relocated Runway 21 RPZ and constructing an additional 1,302 feet of pavement at the Runway 21 end. Additionally, the existing visual approach slope indicators (VASIs) and runway end identifier lights (REILs) for each runway end will be relocated to align these lighting aids with the new runway thresholds locations. The pavement behind the Runway 3 threshold and Taxiway B is planned to be abandoned, and ultimately removed.

The existing segmented circle and lighted wind cone are located within the Runway 3-21 OFA. The recommended master plan concept includes relocating these facilities along the eastern airport boundary as shown on **Exhibit 5A** to conform with OFA standards which preclude any type of development that is not fixed by function (i.e. runway/taxiway lighting) within the OFA.

As previously stated, the Runway 3-21/Taxiway A separation distance does not fully comply with ARC B-II standards. Presently Taxiway A is located 200 feet from the Runway 3-21 centerline. As shown in **Table 5A**, FAA design standards specify a runway/taxiway separation distance of 240 feet. The recommended master plan concept includes relocating Taxiway A 40 feet east to conform with this standard.

Runway 3-21 has an estimated pavement weight bearing capacity of 12,000 pounds single wheel loading (SWL). The facility requirements analysis identified the need to increase this pavement weight bearing strength to 30,000 pounds SWL to accommodate common business turboprop and turbojet aircraft on a regular basis. This is anticipated to be accomplished through a pavement overlay.

Presently, Runway 11-29 provides a dirt surface and is 3,600 feet long. The wind analysis in Chapter Three confirmed that Runway 11-29 is needed to safely serve small aircraft during times when

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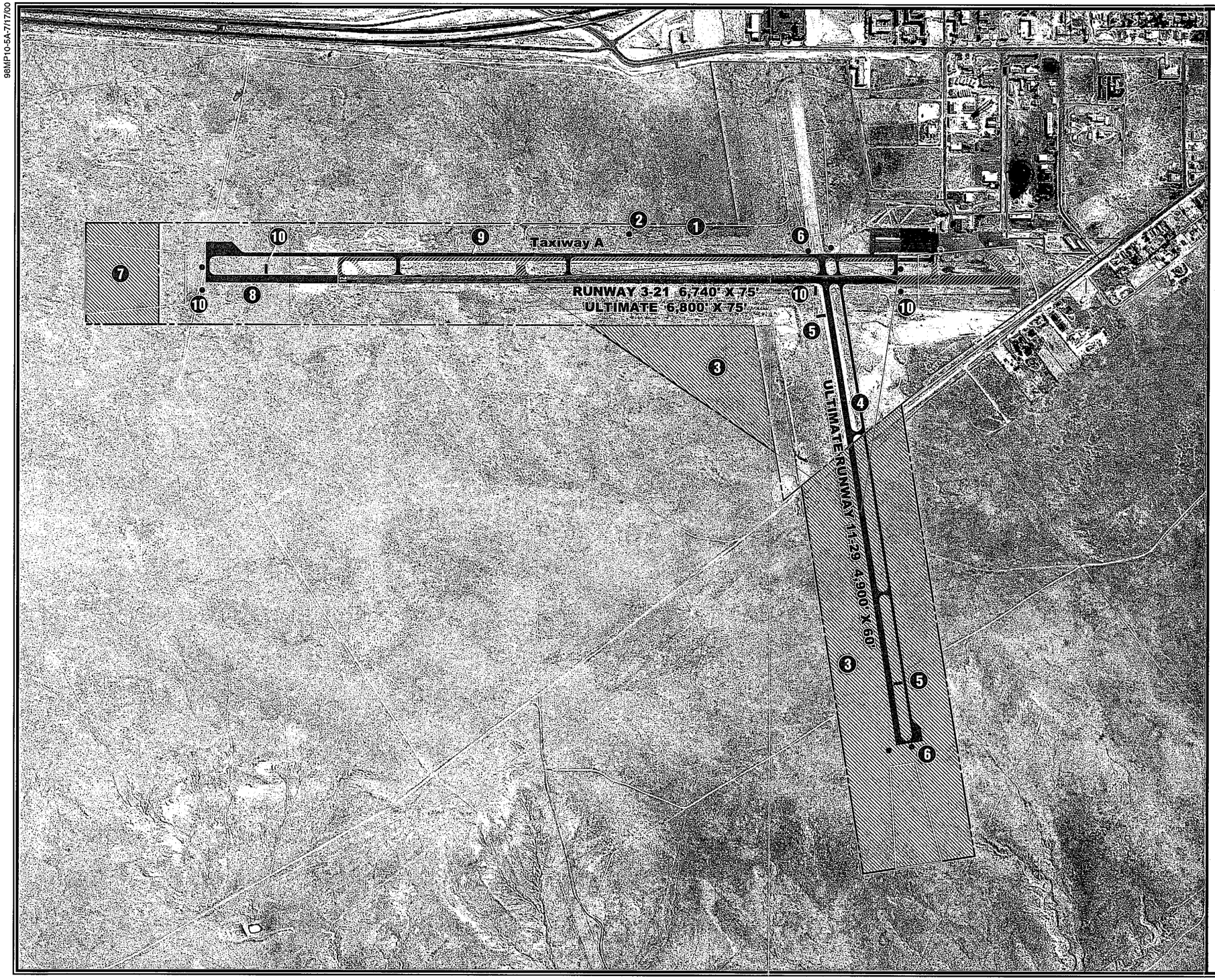

LEGEND

- Existing Airport Property Line
- Ultimate Airport Property Line
- Ultimate Runway Visibility Zone (RVZ)
- Ultimate Runway Protection Zone (RPZ)
- Proposed Pavement
- Proposed Property Acquisition
- Pavement To Be Removed

1. Relocate Segmented Circle/ Lighted Windcone
2. Install Automated Weather Observation System (AWOS)
3. Acquire Property (129 acres) to Construct Crosswind Runway and to Protect Runway Visibility Zone (RVZ)
4. Construct Crosswind Runway 11-29, Install Runway and Taxiway Lighting and Signage
5. Install Precision Approach Path Indicators (PAPI) for Runways 11 and 29
6. Install Runway End Identifier Lights (REIL) for Runways 11 and 29
7. Acquire 17 Acres of Land to Accomodate Runway 21 Relocated RPZ
8. Shift Runway 3-21 1,302' Northeast
9. Relocate Taxiway A
10. Relocate REILs and PAPIs for Runway 3-21

NORTH

0 1,000 2,000

SCALE IN FEET

DATE OF PHOTO: 11-99

MUNICIPAL AIRPORT

Exhibit 5A

RECOMMENDED AIRSIDE DEVELOPMENT

wind conditions are not favorable to landing on Runway 3-21. To enhance the safety of operations on this runway and conform with FAA design standards, Runway 11-29 is recommended to be paved, lighted, and equipped with a parallel taxiway. FAA design standards specify a length of 4,900 feet and width of 60 feet for Runway 11-29.

Runway 11-29 is recommended to be reconstructed in its present location. This closely follows Alternative A presented in Chapter Four, however, the ultimate Runway 29 threshold is planned to be located approximately 240 feet east of the Runway 3-21 centerline instead of 900 feet east as proposed in Alternative A. This ensures the Runway 29 RPZ is located entirely on airport property while retaining property along Navajo Boulevard for development which can increase airport revenues. The implementation of this alternative requires the acquisition of approximately 129 acres of land to provide sufficient area for the construction of the runway and to protect the Runway 11 RPZ and airfield runway visibility zone as illustrated on **Exhibit 5A**. The option of constructing the runway north of its present position as proposed in previous planning documents was eliminated primarily due to property acquisition requirements. Additionally, shifting the Runway 29 threshold to the west eliminated facility development within the RPZ and approach surface to Runway 29 (which was previously used to justify constructing the runway north of its present position).

Global Positioning System (GPS) approaches are proposed for each end of Runway 3-21 to reduce the amount of time that the airport is inaccessible due to low visibility and cloud ceilings and to enhance the safety of operations during these periods. There are currently no existing instrument approaches to the airport. GPS approaches are not planned for Runway 11-29 since this runway serves primarily small aircraft during visual conditions.

Presently, there is no weather reporting capabilities at the airport. The installation of an Automated Weather Observing System (AWOS) is included in the recommended master plan concept to provide pilots with weather details such as visibility, cloud ceilings, and wind conditions and to record historical weather observations for the future planning and development of the airport.

Airfield lighting recommendations include installing medium intensity runway lighting (MIRL) and medium intensity taxiway lighting (MITL) along Runway 11-29, concurrent with the construction of the runway. Precision approach path indicators (PAPIs) are recommended for each end of Runway 11-29 to assist pilots in determining the correct descent path to the threshold. Runway end identifier lights (REILs) have been recommended for each end of Runway 11-29 to provide rapid and positive identification of the approach end of the runway at night.

The recommended master plan concept includes installing chain link fencing around future property acquisition parcels to reduce the chances of wildlife inadvertently accessing aircraft operational areas.

The recommended landside facility layout, as illustrated on **Exhibit 5B**, closely follows Landside Alternative A presented in Chapter Four. This was selected by the PAC as the preferred direction for future landside development as this provides for the construction of facilities along the eastern edge of the existing apron and does not require expanding the apron prior to constructing facilities as proposed in Alternative B. This reduces development costs and facilitates short-term facility development.

This recommend landside layout includes developing a separate public terminal building along the existing apron, north of West Vista Road. Initially, sufficient automobile parking would be constructed to serve the terminal building only. This parking area would be expanded to serve the large conventional hangars once these are constructed. These hangars are planned to accommodate the needs of general aviation operators providing services such as aircraft maintenance, flight training, and charter. The demolition of an existing three-unit T-hangar is planned to provide for the development of a conventional hangar south of the proposed terminal building along West Vista Road.

All fuel storage is recommended to be consolidated near the terminal building for efficiency. This includes relocating the existing 100LL fuel storage tank (located along the western edge of the apron) to this area and the addition of a 10,000 gallon Jet-A fuel storage tank. Self-fueling capabilities are also recommended to ensure fuel is available after normal staffing hours and to reduce fuel costs.

The apron is planned to be expanded to the north to provide for ultimate aircraft tiedown and circulation needs and to replace tiedown positions that could be lost as a result of relocating Taxiway A 40 feet east of its present position.

Future T-hangar development is recommended to follow the alignment of the existing T-hangar and be constructed along the east side of the apron. Approximately 20 T-hangars are planned in this area. Automobile parking will be available n the automobile parking area developed at the terminal building.

The area south of the existing aircraft storage/maintenance hangar is planned for the development of individual/ corporate hangars. Four development parcels have been designated which would provide for the development of hangars as large as 6,400 square feet (80'x80'). Access and automobile parking is planned along the west side of the parcels. The development of these parcels includes the demolition of a house and the existing aircraft storage/ maintenance hangar. These facilities were constructed in the 1940's and are expected to exceed their useful life during the planning period of this Master Plan.

An aircraft wash/maintenance facility is planned south of the individual/ corporate hangar parcels. An aircraft wash/maintenance facility is intended to provide an area for aircraft owner's to complete minor maintenance activities and for the proper disposal of aircraft cleaning fluids and water used during aircraft washing.

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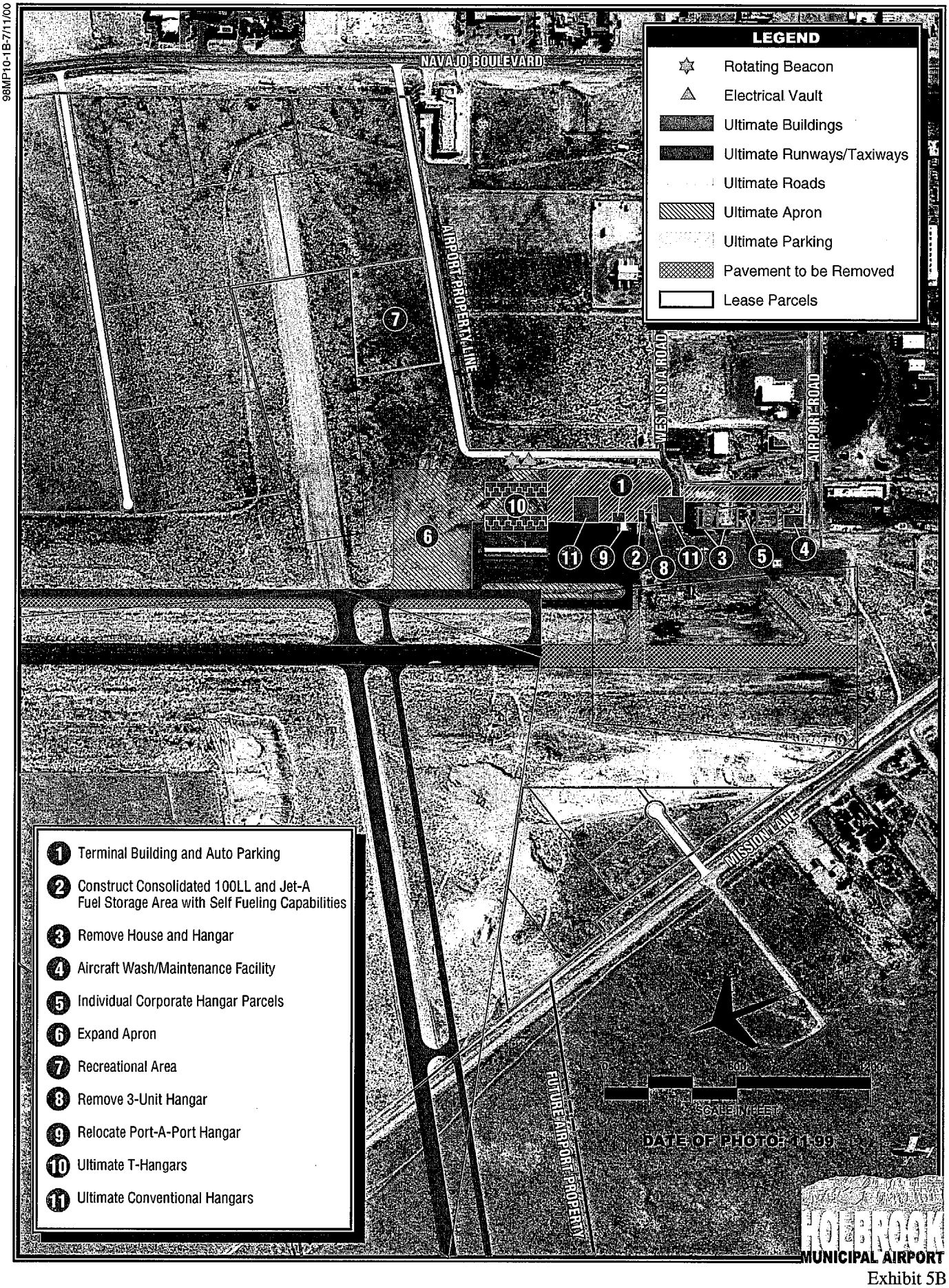

HOLBROOK MUNICIPAL AIRPORT

Exhibit 5B

RECOMMENDED LANDSIDE DEVELOPMENT

A recreational area is planned east of the apron area along the existing Runway 11-29 alignment. This area is initially planned to provide unimproved campsites for aircraft owners. Access to this area is planned from Runway 11-29. Ultimately, the development of a small apron area, improved campsites, and shower facilities could increase the attractiveness and use of the facilities. The development of the recreational area in this location was recommended by the PAC to segregate this area from the main apron area.

A variety of commercial/industrial lease parcels have been designated along Navajo Boulevard and Mission Lane. These parcels are intended to provide areas for aviation and non-aviation related development on the airport. The development of these parcels could provide a significant revenue source for the airport and support airport development needs. Assuming an annual lease rate of .05 cents per square-foot, the 48.7 acres shown for development under this alternative, could produce approximately $104,000 in annual revenue for the airport. Under grant assurances with the FAA, the City of Holbrook can only lease this property. This property cannot be sold without the express consent of the FAA which would release property only considered surplus to airport needs.

AIRPORT INFLUENCE AREA

In 1997, the State of Arizona enacted legislation which gives local communities the ability to establish Airport Influence Areas (AIA) to aid in notifying property owners that they are in an area that is subject to aircraft noise and overflight. The AIA legislation gives the local communities discretion in establishing which property to include in the AIA. The local community is required to give notice and hold hearings on an AIA proposal. Once an AIA is established, the AIA is recorded with the County Recorder.

Facility planning should include establishing an AIA for Holbrook Municipal Airport. To be compatible with the recommendations of this Master Plan, it is recommended that the AIA for the airport comprise the F.A.R. Part 77 horizontal surface. As shown on **Exhibit 5C**, the horizontal surface extends for a radius of 10,000 feet from each end of Runway 3-21 and 5,000 feet from each end of Runway 11-29. At this distance, the horizontal surface encompasses all aircraft traffic patterns and the approach surfaces to each runway end.

SUMMARY

The recommended master pan concept has been developed in cooperation with the PAC and City of Holbrook and designed to assist the City of Holbrook in making decisions relative to future development and growth at Holbrook Municipal Airport. The plan provides for development to satisfy expected airport needs over the next twenty years and well beyond. Flexibility will be a key to future development since activity may not occur exactly as forecast. The plan has considered demands that could be placed upon the airport even beyond the twenty year planning period to ensure that the facility is capable of accommodating a variety of circumstances. The

recommended master plan concept provides the City of Holbrook with options to pursue in marketing the assets of the airport for community development. Following the general recommendations of the plan, the airport can maintain it's long term viability and continue to provide air transportation services to the region.

Per FAA requirements, an official Airport Layout Plan (ALP) has been developed for Holbrook Municipal Airport and can be found in Appendix E. The ALP drawing graphically presents the existing and ultimate airport layout. The ALP is used, in part, to determine funding edibility for future development projects. New color aerial photography and detailed planimetric and topographic mapping was acquired during the planning period for use in developing the ALP. This data was essential in developing an accurate map of the airport and approach surfaces to the airport.

The ALP was prepared on a computer-aided drafting system for future ease of use. The computerized plan set provides detailed information of existing and future facility layout on multiple layers that permits the user to focus in on any section of the airport at a desirable scale. The plan can be used as base information for design, and can be easily updated in the future to reflect new development and more detail concerning existing conditions as made available through design surveys.

Concurrent with the development of the ALP was the development of a number of related drawings to depict the ultimate airspace and landside development. The following provides a brief discussion of the additional drawings to be included with the ALP:

Terminal area plan - The terminal area plan provide greater detail concerning landside improvements and at a larger scale than the on the ALP.

Airport Airspace Plan - The Airport Airspace Plan is a graphic depiction of Federal Aviation Regulations (FAR) Part 77, Objects Affecting Navigable Airspace, regulatory criterion. The Airport Airspace Plan is intended to aid local authorities in determining if proposed development could present a hazard to the airport and obstruct the approach path to a runway end.

Inner Portion of the Approach Surface Plans - The Inner Portion of the Approach Surface Plan is a scaled drawing of the runway protection zone (RPZ), runway safety area (RSA), obstacle free zone (OFZ), and object free area (OFA) for each runway end. A plan and profile view of each RPZ is provided to facilitate identification of obstructions that lie within these safety areas. Detailed obstruction and facility data is provided to identify planned improvements and the disposition of obstructions (as appropriate).

ON-AIRPORT LAND USE PLAN

The On-Airport Land Use Plan is a graphic depiction of the land use recommendations. When development is proposed it should be directed to the appropriate land use area depicted on this plan. This plan also provides a depiction of the future noise contours for the airport. The noise contours are

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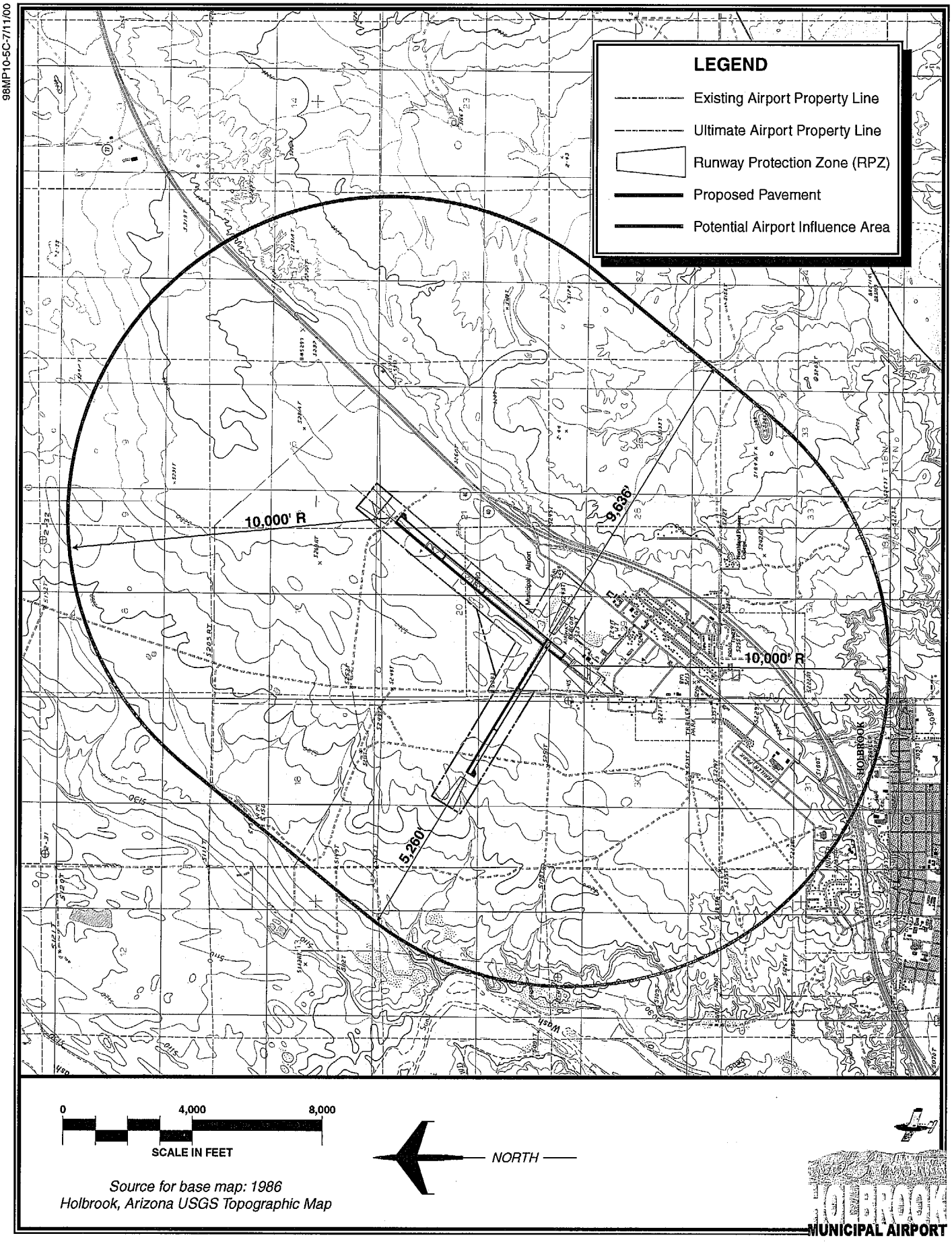

Source for base map: 1986 Holbrook, Arizona USGS Topographic Map

Exhibit 5C
POTENTIAL AIRPORT INFLUENCE AREA

discussed in more detail in Appendix C, Environmental Evaluation.

Property Map - The Property Map provides information on the acquisition and identification of all land tracts under the control of the airport. Both existing and future property holdings are identified on the Property Map.